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Future Business Potential Mapping for Wärtsilä Marine Solutions

Wärtsilä Marine Solutions

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EXAMENSARBETE

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Abstrakt

Examensarbetet är en undersökning av hur den marina marknaden kommer att se ut i framtiden. Examensarbetet har skrivits på begäran av Wärtsilä Marine Solutions. **Syftet** med examensarbetet var att undersöka hur den marina marknaden kommer att utvecklas inom de närmaste åren och vad Wärtsilä Marine Solutions kan lägga fokus på för att hänga med i utvecklingen av marknaden.

Metoden består till största del av insamling av information genom rapporter och redan gjorda intervjuer. Jag har också samlat ihop information över hur dagens marknad ser ut och hur den har utvecklats genom fokus på marknadsområden och fartygstyper. Min studie har en explorativ karaktär.

Studiens **resultat** presenteras i form av text inkluderande av bilder och idéer över hur Wärtsilä Marine Solutions kunde fokusera på framtiden för att öka försäljningen. Resultatet innehåller även en finansieringsmodell som förklarar hur Wärtsilä kan minimera risker i affärerna. I slutet av examensarbetet förs en diskussion på begäran av Wärtsilä Marine Solution gällande mina tankar över vad man bör lägga fokus på.

Språk: Engelska Nyckelord: Wärtsilä HY, bränsle, försäljning, megatrender

BACHELOR'S THESIS

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Abstract

This thesis is about investigating future business potential as a market study for Wärtsilä Marine Solutions. The **main purpose** was to investigate how to marine industry will look like in the future and what technologies Wärtsilä Marine Solutions should focus on in order to keep up with the market development.

The **method** used consists mainly of gathering information through different reports and interviews made. I have also gained different data over information concerning the current market situation and its development through focus on market areas and vessel typologies. My study can be seen as an exploratory study.

The **result** is presented in text, pictures and in ideas on how to increase sales by focusing on certain aspects of the future. The thesis also contains an idea on how Wärtsilä Marine Solutions could minimize risks by using a financing model. The thesis also contains a discussion over my own view on the future of the marine market as requested by Wärtsilä Marine Solutions.

Language: English Key words: Wärtsilä HY, fuel, sales, megatrends

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1 Introduction

The target for Wärtsilä Marine Solutions is to provide customers within the Maritime section with complete solutions for propulsion machinery. Wärtsilä is today a global leader in selling propulsion machinery and equipment on the maritime market. To keep on growing on the maritime market new investments and solutions are needed. Therefore this study is about Wärtsilä and its potential to improve the net sales by providing the customers with different solutions through analyzing the marine market. Today Wärtsilä has been able to provide different types of solutions to different types of customers.

The purpose of this study is to complete an analysis over the future trends within the marine market and how the marine market is expected to look like in the future. The past is easy to analyze with statistics and different kinds of data, but the future is difficult to predict. The task given to me can be seen as a exploratory study, because I'm not allowed to struggle with the past I have to look into the future with open and new eyes.

By analyzing the situation on the marine market information can be collected and provided to Wärtsilä as a company in order for them to be able to improve their net sales within different areas by applying and following the future trends, before its competitors. The director of Lloyd's Register Tom Boardley quoted "Shipping is likely to evolve quickly" which puts all the companies competing on the marine market on alert (Peters, 2016).

1.1 Background – Which pains, problems and concerns exist?

Competition on the maritime market is growing and making it more vital for companies to improve their own solutions. In order for companies to keep on improving new innovations and new ideas are always necessary. Sustainable development is a part of the future and fossil fuels are slowly being out competed by for example Liquefied Natural Gas. As time passes it will demand more changes and it also brings new changes on the market. These changes can be different energy strategies, new legislation and other external effects that the company itself doesn't have to power to affect. Todaythe information about the past is available within the company, but the analyzing the future is more important than analyzing the past. Therefore an effort has to be made in time to keep track on what is going on and which megatrends exist today. Because of the reason data is collected from

the past Wärtsilä Marine Solutions wanted me to create a research on what is coming and how they can increase net sales while focusing on the future.

1.2 Problem area defined

Due to the fact that information from the past is very easily accessible within the company a new research has to be made on what to focus on. *The current problem is that there is no information on what the future holds and what technologies Wärtsilä Marine Solutions should focus on in order to be able to keep up with the market situation*. In order to solve the issue I will look into what different views there are on the future as well as my own ideas on how Wärtsilä Marine Solutions can increase its sales by focusing on the future of the marine market.

1.3 My purpose

My purpose of the thesis is to create an exploratory analysis over the how the maritime market will look within the near future and what the common trends of the market are. This study will also contain information about which geographical market areas are the ones to focus and where the largest shipbuilding countries and companies are found. The purpose of the thesis is also to find out different ways on how Wärtsilä Marine Solutions can increase its net sales using an exploratory or call it somewhat disruptive way to go.

1.4 Limitation of the thesis

Wärtsilä Marine Solutions ordered this thesis to get an understanding on potential business solutions for improved net sales. This thesis is limited mostly to the near future of the marine market. This is because of the many difficulties to create predictions over a long time period on how the marine market and industry will develop. The predictions and analysis have to be made on existing visions from different organizations worldwide.

The focus of the thesis will be on the marine market and on the marine megatrends. However this thesis will also include the potential solutions effect on Wärtsilä Services due to the potential in after sales and service contracts. The thesis will not contain any numerical values on increasing the net sales, only ideas on what technologies could increase net sales and what Wärtsilä Marine Solutions should focus on.

1.5 Abbreviation and acronyms

In this section abbreviations and acronyms are presented as a guide for the readers, opponents and stakeholders.

AMER	The Americas
B2B	Business-to-business
CAPEX	Capital expenses
EMS	Energy Management System
EU	European Union
EUAF	Europe and Africa
GMTT 2030	Global Marine Technology Trends 2030
LNG	Liquefied Natural Gas
LR	Lloyd's Register
MDO	Marine Diesel Oil
MEA	Middle East Asia
MS	Marine Solutions
OECD	Organization for Economic Co-operation and Development
OPEX	Operating expenses
Wi-Fi	Wireless local area networking
Wärtsilä HY	Wärtsilä Hybridmodule

1.6 My thesis

As I see it today and based on discussions within the company, we agree that something and also many things have to be done to act as the most valued partner of the world sea. As I see it we must tighten the activities, processes and the execution processes in order to increase profitable sales. I mean that there is a need for open dialogue between product solutions and sales linked to collaboration between Wärtsilä Marine Solutions and the end users earning their living using Wärtsilä Marine Solutions' equipment.

1.7 Disposition of the thesis

Chapter two

The second chapter contains an analysis over the future of the marine market including marine megatrends. This chapter also includes Wärtsilä's own vision of the future marine industry.

Chapter three

The third chapter explains modern selling and different sales methods.

Chapter four

The fourth chapter contains a real model used and how that has changed the marine industry. This chapter also contains data on what geographical areas are leading the marine industry as well as what vessel types are the most common ones.

Chapter five

The fifth chapter contains the results of the thesis. The results contain a suggestion for a financing model that Wärtsilä MS could use. The results also state what technologies could take over the market within the future.

Chapter six

The final and sixth chapter contains my final conclusions on the study, how I reached my purpose and thoughts about potential further research. This chapter also contains discussion and my own ideas on what Wärstilä MS should focus on in the future.

2 Lenses on the Marine market

2.1 The Marine Megatrends

Wärtsilä has its own vision as well as the EU, but globally there are a lot of different views on how the marine market will look like in the near as well as in the distant future. Difficulties arise when the future can only be predicted and not known. This can give companies competitive advantages by taking a risk, but it could also end up as a complete failure, just because of the unpredictability of the future (Wärtsilä, 2016).

2.1.1 Wärtsilä's vision

During the recent years Wärtsilä has as a company made research about possibilities over what the shipping industry will look like in the future. Wärtsiläs research is made within the company and based on their own believes. The importance of having its own vision about the future shipping industry is very important for Wärtsilä as a company in order to be able to shift focus on more relevant and coming trends instead of the past. Wärtsilä's vision over what the company will focus on and its vision over the marine market in the future are divided into six different groups (Wärtsilä, 2016).

Convoy

Convoys are a part of the future shipping industry. A convoy is a group of vessels closely following each other enabling them to save fuel because of the lower entrance of water speed. When optimizing the usage of convoys significant fuel reductions could be achieved. Convoys would work by taking advantage of advanced communication and controls between systems and components. Thanks to this vessels and shipping fleets could be operated within convoys. *Artificial intelligence and advanced connectivity enables the trailing ships in the convoys to be operated with a smaller crew*. The advanced communication technologies would also increase the ability of sharing information, which would optimize the allocation of cargo and also save a lot of time for the company (Wärtsilä, 2016).

Zero – Floating distribution hubs

Creating artificial islands along main shipping routes is another scenario that could be applied within the future shipping industry. Creating islands a long a rout enables ships to use clean energy and emission free fuels as long as it is produced on these artificial islands. The influence of clean energy is expected to grow within the marine market and it is to be felt more and more in the future (Wärtsilä, 2016).

Exergo – Unlimited Energy Storage

Within the near future Wärtsilä expect that battery energy density will increase substantially. This means that ships will be able to operate silently and without no emissions in sensitive areas for example during arrival or departure to different ports. The battery technology will be used more thanks to the large investments in energy storage (Wärtsilä, 2016).

Z3 – Green energy

Green energy is about providing power without emissions that is reliable without any upfront investment and able to monitor from shore using advanced connectivity to control highly reliable energy sources (Wärtsilä, 2016).

LIITOS – Working together

Cargo sharing is something the will make shipping more efficient and allow global operators to access the same information. This means that container ships will not sail free of cargo. A digital tool will help achieving the sharing of assets and will make cargo sharing more efficient (Wärtsilä, 2016).

BEAN to Cup – Manufacturing en route

In order to save valuable time in production factory ships will be built in order to process for example coffee beans during the transportation from South America to Europe. This means that the factory ships develops the coffee beans to a ready product during the voyage, instead of spending time on processing beans before the shipment. This would enable companies to save time and enhance the seasonal crops by having a ship processing soon after harvesting (Wärtsilä, 2016).

2.1.2 Wärtsilä Smart Marine Ecosystem

Wärtsilä's smart technology group is harnessing changes within the shipping industry to deliver optimization and values for its customers. Through high levels of connectivity and digitalization Wärtsilä has been orchestrating these values as they intend to lead the industry's transformation towards a Smart Marine Ecosystem. The marine industry has challenged all players on the market with major sources of inefficiencies or "waste" that can have a significantly negative impact on profitability and business operations. These inefficiencies can be such as overcapacity, time wasted waiting for permission to enter ports or when entering other high traffic areas and inadequate port-to-port fuel efficiency. Wärtsilä's strategy towards the Smart Marine Ecosystem thinking includes eliminating these kind of inefficiencies (Wärtsilä, 2017).

Wärtsilä has created for primary objectives that will re-shape the marine industry (Wärtsilä, 2017):

1. *Shared capacity* will be used for reducing unit costs and improve fill rates.
2. *Big data analytics* optimizes operations and energy management.
3. *Intelligent Vessels* enables optimised and automated processes.
4. *Smart ports* results in faster and smoother port operations.

Wärtsilä has already together with the vessel owner taken a step towards the future when remote control testing was successful of a vessel's operations from a distance of 8000 kilometres via satellite. The test was carried out without land-based technology using standard bandwidth for communication between the remote operator workstation and the vessel. Wärtsilä has also created other notable examples such as Wärtsilä HY and Wärtsilä's wireless charging innovation for battery-driven vessels. Through smart technology Wärtsilä can serve customers in a more sophisticated way and as well as that Wärtsilä aims to deliver greater efficiencies and for the owners and operators can help them increase revenue and profitability (Wärtsilä, 2017).

2.1.3 EU's vision

EU has a clear vision over the benefits of autonomous shipping in the future. For EU autonomous shipping would provide users with a fully integrated system that highly automated and through that also safer and more efficient (Marle, 2017). The autonomous shipping would increase the importance of connectivity between infrastructure and cargo, which also would improve the capacity management data (Marle, 2017).

2.1.4 Global vision

Globally there are a lot of different views on the potential future of the marine market. Shipping will change quickly and in only about then years it is expected to have changed significantly compared to today's situation. Globally the focus lies on developing LNG as a fuel and using it more often in new buildings.

Wireless monitoring – sensors

Sensor technologies have stepped into a new generation where the need for regular visits to remote locations will be removed completely. This new generation of sensors will be able to collect autonomous data and then relay the information in real time. By adding these sensors to the vessels ship owners will be able to improve maintenance cycles of vessels including condition monitoring and condition-based monitoring. For example these sensors can notify ship owners when and if a piece of equipment requires maintenance. A wireless sensoring network needs to be miniaturized and have self-calibration characteristics. However, when introducing big data analytics the cyber security needs to be top quality within the wireless technology (Peters, 2016).

Reducing human interaction through robotics

By 2030 three new robot types will be introduce and used in commercial shipping (Peters, 2016):

1. A *learning robot*.
2. A *practical robot* that can handle an asset.
3. A *mini-robot* that will be used for inspection of harsh environment for identifying and record pollutants and emissions.

Together with development of sensors and remote control technologies these robot types are likely to be developed. By introducing usage of robots human interactions with dangerous processes will be reduced and at the same time robotics are reported to be a growing trend in the future opening up more possibilities for robots and less human interaction (Peters, 2016).

Communication

While the digitalization increases in the world the communication between configuration grows. The communication improvement between Wi-Fi and 5G connectivity will allow ship operators to get access to live video and audio from recording devices that are be found on-board the ship. This improvement will reduce the need for physical surveys on-board. This enables real-time reporting and decision making in ship management. Crew welfare will also be improved thanks to the enhancements in communication between ship and shore (Peters, 2016).

New technologies in power and propulsion

In the future the power generation will change with potentially energy-saving devices, renewable energy, alternative fuels and hybrid power generation playing a part. GMTT 2030 names two challenges in the future shipping industry: environmental and commercial challenges including rising fuel costs and fleet overcapacity. Due to the fact that the climate change always will be on the agenda, GMTT 2030 mentions that future governmental carbon policies could cause and increase in usage of for example hydrogen fuel cells and other alternative fuels. These new technologies will most likely start to be tested in offshore support vessels, short-sea vessels, yachts, tugs and inland waterway vessels (Peters, 2016).

As for starters Wärtsilä is a leading global example with their newly introduced Wärtsilä HY solution, which is the world’s first fully integrated hybrid power module. These solutions combines energy storage systems with engines and power electronics that are optimised to work together with a newly developed EMS (Wärtsilä, 2017).

Autonomous systems

Today more and more autonomous vehicles can be found within different industries. This phenomenon will improve in the future not only within air and car industries but within the shipping industry as well. Even though autopilots are commonly used today on-board ships, the future will develop to the point that ships will be autonomously steered and from shore and not on-board the vessel. Underwater, surface and air vehicles will become a mixture where they will be fitted with marine renewable energy-harvesting devices, advance propulsion systems, communication capabilities and sensing (Peters, 2016).

The technomax era

The future will bring new ships built from different materials in order to make vessels lighter than today, these advanced materials can be graphene, while graphene coating embed for sensors for performance monitoring (Peters, 2016). LR as a classification society has revealed the future technology of ships with its TechnoMax container ship in 2030 (Container shipping and trade, 2015). The TechnoMax ships are envisioned to have decision-support-systems connected to shore, these systems will enable maintenance management, navigation and communications making the TechnoMax a "smart" ship (Peters, 2016). LR has envisioned the future adoption of alternative fuels for merchant vessels, which includes a greater use of LNG and biofuels.

2.2 Digitalization of the marine market

Digitalization is steering the development of different industries within business. For the maritime industry digitalization will have an impact as well, the maritime industry is already going through a stage where everything will be digitalized eventually. Digitalization will result in more communication between the shore and the vessel. This means that ships will constantly be connected to devices that can be managed from shore. Basically you can say that the autonomous shipping is a result of digitalization. Digitalization will provide the customer with real time information and numbers. By digitalization the customer will also be able to help the customer increase revenue and their performance (Wärtsilä, 2016).

Chapter three is the study's short theory presentation.

3 Theory building – Modern Selling

In this chapter relevant theory based on writings both in books and journals is presented. During the literature review I have noticed that there is a lot of both theory and linkages to practice, but more for the consumer sector than for the industrial sector. I can now also state that no specific book or journal is written dealing specifically for Wärtsilä and my subject.

I present three relevant theory building in the following sections with bridges to grow a company's sales, revenues and possibilities to grow the business.

3.1 Solution sales

During the last decade Wärtsilä MS has been shifting focus to selling complete solutions instead of products. The reason for moving towards solutions sales is because the customer is in need of a solution it is easier to have one supplier and one contact instead of many different ones. This will also create a value for the customer itself by reducing extra costs of having for example many different engineers or technicians on-board fixing different problems. Solution selling therefore enables the customer to call Wärtsilä and have Wärtsiläs technicians to maintain the complete solution instead of just small parts of it. Solution selling can also be related to selling a solution or selling to solve a problem the customer has. Solution selling engages the seller after the customer has presented a problem that needs to be solved. Solution selling is an option when the customer knows that they are buying the optimal solution for their problem (Sales Performance International)(Manning, Ahearne, & Reece, 2014).

3.2 Value based sales

Due to the reasons that competition between different companies making business on the marine market it is vital to stop selling benefits of products and move towards a more value based selling. In order to succeed on the marine market against all other competitors and improve the own margins is by viewing the market situation from a customer point of view. The customer is the one who pays for the product and who uses the end product, therefore the customer is the one who needs to get most of the value of a solution or a product if the company itself wants to improve its sales. Wärtsilä has already implemented

the usage of value based selling to some extent. Value proposition models have been created for different types of projects and at the same time they are used more and more today. Different reports have been made that on average 87 % of a company's revenue in B2B sales are generated by only 13 % of the sales population (Apollo, 2015). Within the best-in-class sales organizations the gap between the rest and the best is narrower, this is caused by principles and value based selling (Apollo, 2015).

1. Focus on the customer's value of solving a problem.

Value based selling focuses on the value of dealing with an identified problem. If a prospect is unable to articulate costs and consequences of a problem and the solving value, the chances of getting an organization to agree to invest in a solution is small and so are your chance of winning a case (Apollo, 2015).

2. Specify what value you are offering.

When using value based selling as an option in your sales process, the value based selling and the value propositions must be created specifically for the value you are offering the customer. Very often companies create value proposition models that apply for the complete worldwide market and this is something companies have to stop doing and instead create a personal unique value proposition for the customer (Apollo, 2015).

3. Capture and create meaningful interaction value.

The third principle of value based selling is the possibility to establish a mutually meaningful value in ever interaction with the customer (Apollo, 2015).

4. Facilitate the customer's buying process and not your sales process.

Your sales approach and its key phases in your CRM systems have to be designed around the customer's milestones and key phases in his buying decision journey. Your sales activities, shareable content and sales tools must be designed to meet the customer's buying decision process in order for you to advance with a well-qualified opportunity (Apollo, 2015).

5. If you are not able to contribute distinctive value then qualify out.

This is a simple principle: if your solution does not offer a higher-value approach or a distinctive value than other solutions solving the identified problem, you need do change your approach or qualify out (Apollo, 2015).

3.3 Insight Selling

Insight selling is about creating an insight in the customer and in order to sell a product or a solution in order to increase sales. When using insight selling as a sales method the seller first needs to educate potential customers with new ideas and new perspective. Secondly the seller needs to co-operate with the potential customers and finally the focus is to be put on the customers result more than on the own sales (Schultz & Doerr, Insight Selling, 2014). Insight selling is about creating an understanding for the customer and insight selling has a natural connection to social selling (Schultz, What is insight selling?; Schultz & Doerr, Insight Selling, 2014). The social selling creates the initial contact and insight selling takes it further to closing the deal (Schultz & Doerr, Insight Selling, 2014).

Chapter four is focusing on what is going on in the field, i.e. what is in use.

4 The real test – a test simulated model

4.1 Wärtsilä HY the real model

Wärtsilä HY is the prefect example of a complete modularization of a solution. Wärtsilä has connected different components into one great solution based of future demands both seen from a marine market perspective and from a legislation point of view. Wärtsilä HY is optimized for the future of the marine market as it is the first hybrid power module produced in the marine sector. Wärtsilä has successfully produced a tailor-designed power module by turning a complex system into an innovative product the can deliver and guarantee performance. Wärtsilä HY is a solution that has set up a new challenge and established a new benchmark the marine industry, where the focus has been on reducing emissions while improving the performance (Wärtsilä, 2017).

4.2 Most common vessel types

It is important to understand which ship types are the most common ones in the merchant fleet. This statistics has a significant meaning over what type of business is done on the maritime market today.

Figure 1 Merchant fleet development 2008 - 2017 (Statista, 2017)

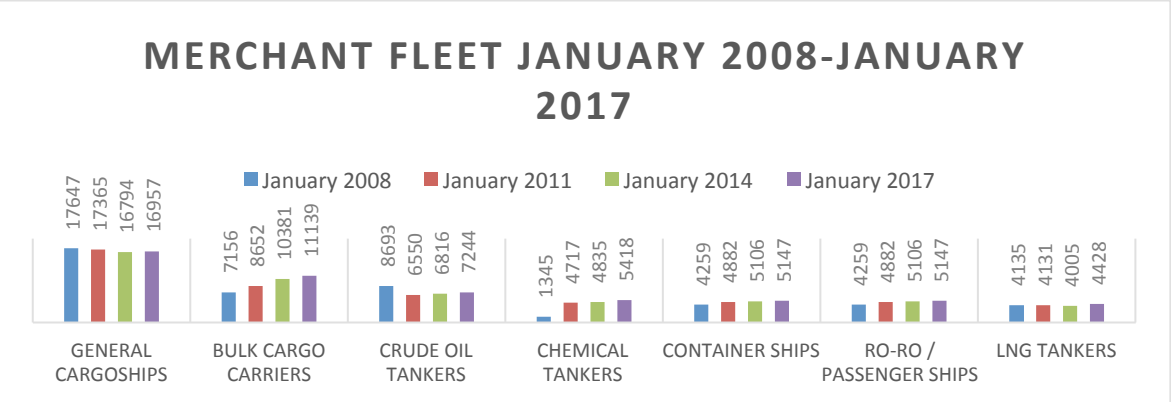


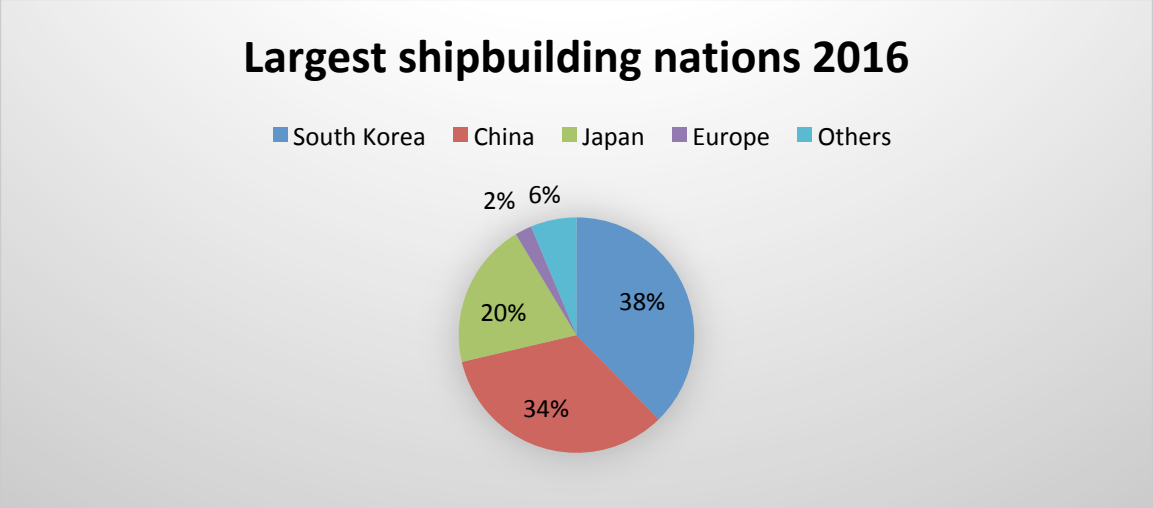
Figure 1 shows the development of the merchant fleet from January 2008 to January 2017. The fleet is divided into seven different categories of ships. The most common ship type on the merchant fleet is general cargo vessels that can carry for example wood, steel, rolls of paper and other building material. General cargo ships can also be refrigerated ships. However the amount of general cargo ships has been declining for the last couple of years. Bulk carriers are increasing and the second largest ship type on the merchant fleet. Bulk

carriers carry for example grain and coal or other similar cargo types. The amount of crude oil tankers and LNG tankers has been shifting up and down during the last years. As the importance of environmental friendly fuel increases so will the LNG tanker fleet increase at the same time. The importance of chemical tankers has also increased by 400 percent since 2008 because they transport hazardous chemicals that other ships cannot transport. Finally the amount passenger ships and Ro-Ro vessels has slowly increased as for example the cruise industry has developed during this century and huge orders for new cruise ships have been made (Statista, 2017).

4.3 Leading shipbuilding countries

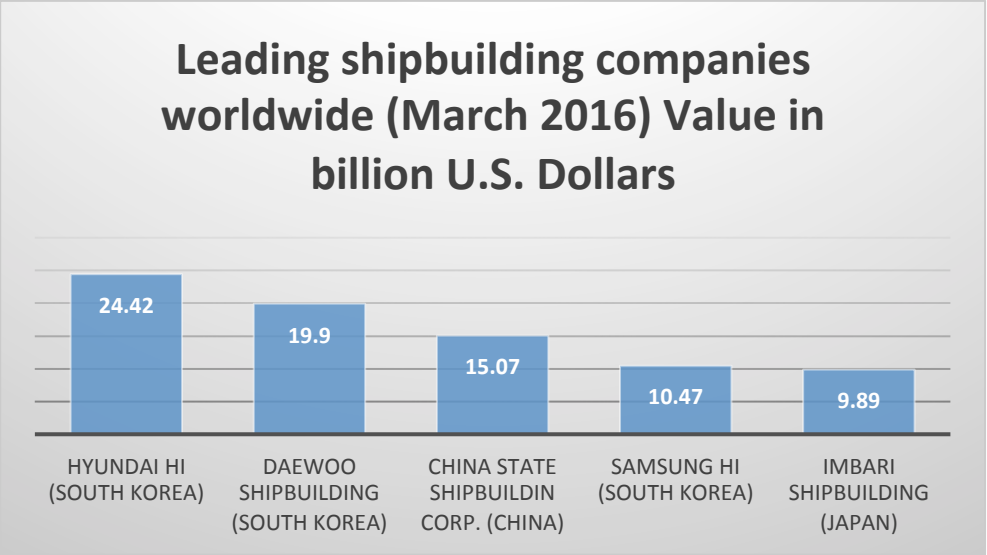
Today ships are built all over the world and all the time. Since the beginning of the 1990's Asian shipbuilding industries has taken over the market share, while European shipbuilding industries slowly have been declining (Colton & Huntzinger, 2002). As of 2016 the leading shipbuilding countries were as follows:

Figure 2 Largest shipbuilding nations 2016 (Statista, 2017)



As seen in figure 2 South Korea is the largest shipbuilding nation worldwide measured in gross tonnage. This statistics are limited to built ships larger than 100 gross tonnage. As seen in the pie chart in figure 1 the leading shipbuilding nations are located in Eastern Asia. South Korea has moved past China in this area after 2015 (Statista, 2017).

Figure 3 Leading shipbuilding companies (March 2016) with geographical location (Statista, 2016)



As shown in figure 3 the leading shipbuilding companies measured in billion US dollars are located in Asia. Out of these five shipbuilding companies three are located in South Korea and the two others in China and Japan (Statista, 2016).

Chapter five presents the results of the thesis.

5 Thesis results

Due to the fact that the marine market is constantly changing new types of fuels are introduced and tested in order to become more sustainable and environmental friendly. As the market has developed until today and looking into the near future LNG seems to be a common factor as a marine fuel. LNG has also quite recently been introduced to the market and therefore it is also here to stay for the coming future. As used in the Wärtsilä HY batteries are starting to make their way into the marine market. Batteries and electrical cars have been used for a couple of years already but this is very new when it comes to the marine industry. Therefore one can say that a combination of batteries and LNG is what the marine market is expected to us within a couple of years. Batteries however provide a possibility to store energy, storing and reusing energy is environmental friendly and also very economical for the ship owners. So when it comes to powering a ship LNG and batteries will be the future power.

Looking at the connectivity between ships and steering of ships everything will become more automated. Improving the connection between the shore and the ship will be vital in order to keep up with the development of the marine industry. By automated it is meant that autonomous ships will be used and the market is slowly moving into that direction. However for now the autonomous shipping is a bit further on in the future, because of the uncertainties that there still are in this area.

The results of the study are presented section wise in seven sections.

5.1 How can Wärtsilä MS improve net sales within different vessel typologies?

Increasing net sales within different vessel typologies can be done in different ways. It is important to understand that every solution and product has its own sales margins and also its own value propositions. Different products give the customer a different value and customers in certain market areas are in need of different solutions than ones in another area. For example this can concern the Baltic Sea in which icebreakers are needed during the winter and have a hull design and need of power. While in the Mediterranean Sea icebreakers aren’t needed and the use of other types of vessels are more important. This concerns types of vessels and also in which market area the vessel is going to be used.

Cruise ships, ferries and yachts

The reason why these three vessel types are under the same headline is simple because these are all vessels that carry passengers. In most cases these vessel types are carrying paying customers and therefore the requirements should be a bit different when it comes to the marine products. Cruise ships and ferries however are larger than yachts and the engine room is therefore better hidden than on a yacht. What passengers do value are environmental friendly solution or in other words zero smoke and a relaxing journey without extra noise. Zero smoke can be obtained by using eco-friendly solutions like LNG and battery solutions. Visible smoke means pollution for a passenger and can cause negative experience from a trip. The solutions provided by Wärtsilä MS should be as quiet as possible. This can be very difficult but hybrid and battery solutions are usually very quiet. When it comes to passenger vessels LNG should be a product of interest for the customer and could also be motivated by a value proposition made by Wärtsilä MS. At this stage of the development hybrid solution should be a way to increase net sales, because it can save a lot of costs in fuel for the customer and also has a back-up solution when not running on batteries.

Special vessels

Fishing vessels are in need of performance that can keep them out on the sea for a longer time. This can be accomplished by combination of different fuel types and a more efficient propulsion equipment as well as machinery. The longer a fishing vessel is out on the sea the higher the fuel consumption will be. Therefore offering more efficient engines with lower fuel consumption is important as well of creating a solution that could include a low-carbon option while fishing at sea. This solution could be for example a battery and an energy storage option. The energy storage should help the fishing vessel to use stored energy to save costs and keep them out on the sea for a longer period of time (Mueller & Ohmayer, 2012).

Merchant vessels need space in order to fill up cargo and transport. This is something that restricts the owner usage. The importance of long distance performance and weight demands arise when it comes to the optimization of a merchant vessel. Merchant vessels are mostly the vessels that are travelling long distances and are out on the sea for a long period of time. Auxiliary engines are very important to provide electricity for cranes and other necessary loading equipment (Mueller & Ohmayer, 2012).

Navy vessels are very demanding and many Navy vessels are in need of both a diesel mode and an electrical mode, however the electrical mode is exceptional for Navy vessels because they constantly require high speed. This means that while on driving with the electrical mode a Navy vessel should be able to maintain a speed of at least 20 knots or more (Mueller & Ohmayer, 2012). The Navy propulsion systems should of course meet the IMO Tier III requirements and even more demanding requirements if possible. Fuel consumption is very important for Navy vessels as well and should be as low as possible and therefore hybrid options are considered very attractive as long as they can meet the speed requirements (Mueller & Ohmayer, 2012).

Offshore Vessels

Offshore vessels are vessels that have to be ready on a standby mode and need to have an emergency plan ready. This is something that Wärtsilä's scope of product should include with a fast-start mode and a possibility to keep the engines running at all-time if needed. Wärtsilä can also offer navigational equipment that meet the requirements for offshore vessels.

Wärtsilä HY

Wärtsilä HY is one of Wärtsilä MSs' complete solutions and therefore also an important solution for the company itself. Wärtsilä HY has set up a new era in its market and this is one focus area which Wärtsilä MS should take control of.

In the end as far as it is possible Wärtsilä MS should offer its existing and potential customers complete solutions like for example engines, batteries and propulsion equipment. This can be motivated by so called one-stop-shopping and this would be more beneficial for the customer when it comes to maintaining their vessels. Wärtsilä could then send one engineer to fix problems on all Wärtsilä equipment, instead of having the customer to dock and have engineers from several different companies to come onboard. Wärtsilä MS already has a wide scope of products and that is a benefit not only for the customer, but for Wärtsilä MS as well.

5.1.1 What will power the marine industry in 2050?

Within 30 years the marine industry is expected to develop in different ways according to a report made by a team at University College London Energy Institute. This report contents are opinions from 12 different marine experts working at different maritime organizations or companies. The expectations are that we in the future will see more decarbonized solutions and resources containing less carbon (Kinthaert, 2017). The importance is to reduce emissions within the marine industry due to strict regulations and this will give more importance to batteries, hydrogen fuel cells and wind technologies (Kinthaert, 2017). Due to the Paris climate agreement all vessels must operate in a net zero emission world by 2050 and by 2040 lithium-air fuel cell batteries are going to step up from the current lithium battery technology (Kinthaert, 2017). During port-time generating electricity from wind and solar power would be used as green electricity charging, the batteries would eventually take over the space in the engine room (Kinthaert, 2017). The expectations are also that LNG and biofuels will outgrow other fuels within the near future and thanks to the increased infrastructure within the LNG shore industry LNG is also more easily accessible (Kinthaert, 2017). The most important aspects from the report are the low-carbon thinking, greener shipping, biofuels, LNG, lithium-air fuel cell batteries and zero emissions that will take over the marine market by 2050 (Kinthaert, 2017).

5.2 Increasing sales through leasing and financing

5.2.1 Ship Leasing

For increasing net sales within the marine industry leasing can be an option. Leasing is same as renting out a certain type of product or equipment. This can for example be an aircraft, which is very common as a leasing product. Leasing can keep the customer from risking the business while getting full service agreements and maintenance from the seller. For the customer leasing a product or a solution will give them certain advantages such as: no rents on the balance sheet as leased products are accounted as operating expenses that can be deducted from profits, leasing also improves the customer's cash flow (FASB, 2009). As for the Wärtsilä MS leasing can be a solution to improve net sales and keep the products within the company. Leasing provides the seller with a benefit of closing a deal more quickly and efficiently. By being able to close a deal payments can start immediately both in affordable and attractive terms. Document delivery can be handled within a shorter period of time and the products can be delivered quicker than when buying a new one.

When leasing out equipment or products you increase the customer's purchasing power. This is thanks to the reason the monthly lease cost of a unit or additional features is very small and your customer can increase the size of their purchase and therefore improve the seller company's profits. By leasing the seller can change a negative price image into a price that is easily budgeted. Leasing increases the customer loyalty and leads to more acquisitions of new equipment than with a straight purchase (Government Leasing LLC).

5.2.1.1 Leasing opportunity

The leasing opportunities are found on products that are a bit easier to access. This can be propulsion equipment such as a propeller. A Propeller or a thruster can be changed and maintained easier than an engine on a ship thanks to the fact that these are located on the outside of the hull. The leasing idea would apply best to smaller vessels such as tugs boats, offshore vessels and other special vessels. While for larger vessels the opportunity of leasing products would apply only the more easily accessible products such as for example propulsion equipment.

5.2.1.2 Problem Area

However difficulties arise when it comes to leasing due to the reason that the engine rooms is located inside the superstructure of a ship. This applies for most types of vessel. Therefore the development of the marine market should become more applicable to the leasing market. Ships can be built with the engines closer to the main deck, which would allow the customer to be able to replace old engines with new or maintain them quicker. The cost for the customer rise when the access to the engine room is restricted. Using a hatch from the main deck to be able to lift out an engine would therefore have to be invented in order for leasing of engines to work.

5.2.1.3 Wärtsilä business potential in leasing

Leasing is as mentioned an effective way to increase net sales or revenue within a company. Not only for the company that is leasing the product, but for the seller company as well. Wärtsilä MS has developed an interesting product in the Wärtsilä HY-tugboat. However using the leasing option Wärtsilä MS should consider building a tugboat for the company as a prototype that could be leased to different customers. This idea would set up a benchmark for the whole marine industry and show the products reliability. At the same time Wärtsilä MS could offer customers the opportunity to lease a tugboat and in that way improve both the customers and Wärtsilä MSs' net sales. This idea is something that not

only could improve the net sales within Wärtsilä MS, but also demonstrate the Wärtsilä HY solution that Wärtsilä MS are offering.

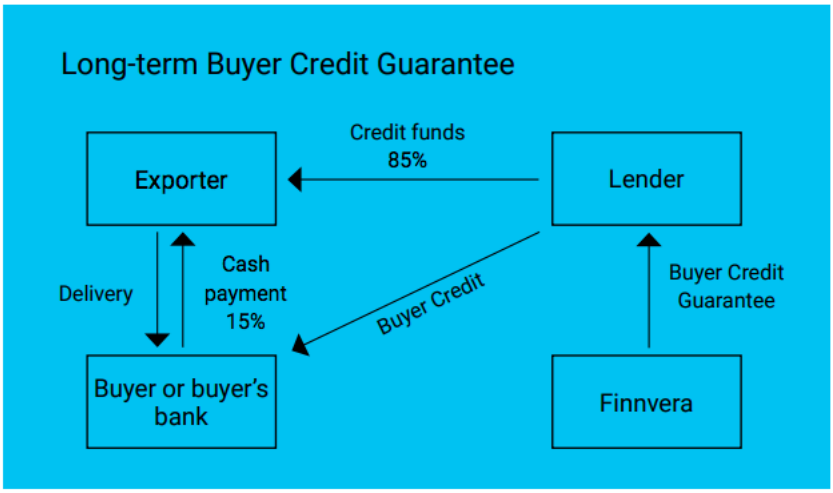
5.2.2 Financing model

Instead of leasing a product a financing model could be implemented that can benefit both the seller and Wärtsilä MS. The idea of having a financing model could help increasing the net sales within Wärtsilä MS by earning a little extra if a customer would be able to pay an order in installments. This gives the seller and the buyer certain benefits but also comes with risks that would have to be taken care of and carefully considered. Considering Wärtsilä's earlier test with different models a new model should be considered where the company could use Finnvera Oyj as a company to offer a *Buyer Credit Guarantee*. The idea of using Finnvera as a partner is for the lender to receive a security in order to receive its money.

5.2.2.1 Finnvera Buyer Credit Guarantee

Finnvera offers the exporter a possibility to transfer risks from a sale to Finnvera. Finnvera as a company can guarantee that the exporter receives its money for the sales process. The borrower can be the buyer or the buyer's bank. First Finnvera analyses the creditworthiness of the buyer before making a decision on the guarantee. Creditworthiness of the country of the borrower is assessed by both political and economical developments in the country (Finnvera).

Figure 4 Finnvera long-term buyer credit guarantee (Finnvera)



As can be seen in figure 4 the long-term buyer credit guarantee enables the buyer to loan up to 85 % of the total contract value. At least 15 % of the contract value has to be paid to

the exporter or the seller (Finnvera). Long-term buyer credit guarantee can be granted to for example OECD countries.

Figure 5 Short-term buyer credit guarantee (Finnvera)

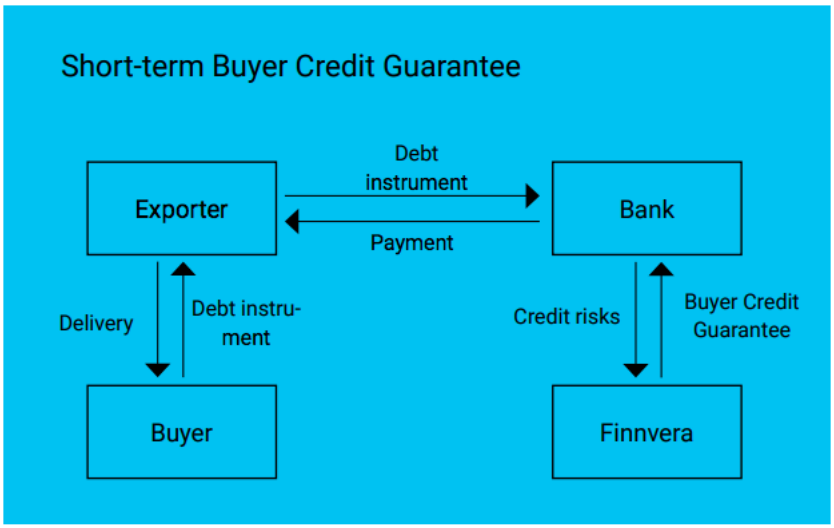


Figure 5 shows the short-term buyer credit guarantee that Finnvera offers. Short-term guarantee can normally be granted only for exports to countries with political risks, in other words not to EU member countries or Western Industrialized countries (Finnvera). Short-term buyer credit guarantee can be granted for single transactions or deliveries, however the guarantee is normally used for continuous exports. A debt instrument is as the figure shows obtained from the buyer. Since no contractual relation between the exporter (seller) and Finnvera exists, the bank is not authorized to sell debt instruments bought from the exporter to a third party (Finnvera).

5.2.2.2 Benefits

The benefits of applying the buyer credit guarantee is that all risks are transferred from the exporter to the lender and finally to Finnvera (Finnvera). The guarantee covers both political and commercial risks. The guarantee can be used for several buyer credits such as ship financing, leasing and single transactions. The guarantee is also available in short-, medium- and long-term arrangements applicable according to both the exporter and the buyer's best interests (Finnvera).

5.2.2.3 Risks

Commercial risks

The borrower's inability or unwillingness to pay is meant by commercial risks. The commercial risks can be covered up to 95 % depending on if it is a short- or long-term guarantee. A short-term guarantee can cover up to 90 % (Finnvera). The exporter can therefore be left with a risk of 5-10 % depending on the guarantee (Finnvera).

Political risks

Risks connected to the borrower's country are considered political risks. Political risks can be completely covered (Finnvera).

Conditions for granting the guarantee

In order for granting the guarantee the export has to meet the requirement of the Finnish interest (Finnvera).

Guarantee costs

A guarantee cost is charged as a flat fee based on the principal debt instrument. The guarantee cost premium is dependent on the credit period, the creditworthiness of the borrower's country and other securities provided for the credit guarantee. In some cases a handling fee may also be charged for changes made to the guarantee (Finnvera).

5.3 How can Wärtsilä MS increase their net sales within different geographical areas?

Increasing net sales within different geographical areas can be made mostly through getting one product or solution into the market. Since Wärtsilä MS has a very tiny market share in Special vessels on the American market, the potential to get into the market is enormous. The idea would be for Wärtsilä MS to focus more on getting into the American market and set up an example for its product in order to eventually increase sales within the area. The way to increase market share is to offer something to the customers that a competitor cannot offer and these are made through value propositions. In order for Wärtsilä MS to get into a market or to increase market shares in a certain geographical area Wärtsilä MS has to offer value to the customers. The problem when the market share is small is that it is difficult to get into the market with similar products as the competitors

have. Therefore Wärtsilä MS should offer solutions with unique values for its potential customers.

5.4 What are the most strategic products within the Wärtsilä MS scope?

As mentioned Wärtsilä MS has a wide scope of products, this scope has grown during the last couple of years thanks to acquisitions of different companies. However Wärtsilä MS is already known for its engines and this is also the most important product seen to today's market situation. The engines are the ones running the vessels today and this is something that has been for a long period of time. This does not concern one specific engine but the newer ones, because the newer engines are the ones that will survive for the longest as the technology develops. An example of the new era engine is the Wärtsilä 31, because of its performance data and its low fuel consumption. The limitations are however restrictions in regulations and therefore the NOx reducer is a vital component to be offered with engines, in order for the engine to follow up with all requirements such as the IMO Tier III. In order words exhaust gas-cleaning products are strategic parts for Wärtsilä, seen to the future and what is to come. There is one product or one solution that has been innovated during the last years and this is the Wärtsilä HY. Thanks to this product Wärtsilä MS has raised the bar and the demands on the marine market. The demands are a cleaner world and a more efficient way to escort large vessels in and out from ports. The technology used in the Wärtsilä HY is also something that has benchmarked the complete marine industry and what will be used in the future within all vessel typologies.

5.5 Value propositions = Why buy from Wärtsilä MS?

In some cases it is also impossible to compete with the sales price of a product or a solution compared to a competitor's price offer. However in this case Wärtsilä MS should put a lot of effort in creating more value for its products by value propositions. Wärtsilä MS has already made value proposition models for specific vessels. However the focus should be customer specific and every customer should have its own value proposition model tailored for their needs before signing a contract, this would also help Wärtsilä when negotiating. Wärtsilä MS can however offer a lot of unique values such as providing complete documentation for the customer, thanks to its large scope of products. Wärtsilä can as a company sell complete solutions and at the same time focus on delivering the solutions as a complete package to reduce extra costs and save time for the customer.

Having Wärtsilä as a seller would also enable the customers to use Wärtsilä Services for maintaining the whole solution and providing spare parts for the customer. This would enable the customer to reduce maintenance costs and external engineering costs, due to the fact that Wärtsilä could offer a person to maintain the complete solution, instead of having one engineer for each separate product. The Wärtsilä knowledge is therefore something to value as a customer. Wärtsilä is a global leader within smart technologies and offer complete lifecycle marine solutions. As a company Wärtsilä emphasizes that efficiency, data analytics and sustainable innovation maximizes the economic and also the environmental performance of a vessel (Wärtsilä Corporation, 2018).

5.6 After sales + service agreement potential

Wärtsilä has a huge potential in after sales, thanks to its services department. Wärtsilä can offer customers long-term and short-term service agreements after selling a product. The key to improve Wärtsilä's after sales includes involving Wärtsilä Services more in the sales. Wärtsilä should always emphasize its customer to sign an agreement over spare parts and maintenance for a couple of years from the contract date. In 2017 Wärtsilä Services signed a performance-based agreement with Carnival Corporation (Wärtsilä Corporation, 2017). In order for Wärtsilä MS to increase its net sales, they have the possibility to include a service agreement into the contract, not only for the new product but for the customers need if there are any. This is something that Wärtsilä MS can use as a value proposition and at the same time maintain and create long-term relationships with its customers. Thanks to the agreement with Carnival Corporation the two companies can together measure a vessel's energy efficiency and fuel consumption, which in the end could lead to saving tens of millions of euros per year in fuel costs for Carnival Corporation (Wärtsilä Corporation, 2017). The agreement with Carnival Corporation should set an example of the potential that there is in service agreements.

5.7 Geographical focus areas

As a result of the research made, there is no doubt about where the majority of the market exists. The market area that the company should focus on is Eastern Asia and more specifically South Korea, China and Japan. The market is developing and moving towards Asia more and more.

Figure 6 Wärtsilä Market share over sold output in kW and total amount of engines sold 8 (Wärtsilä)

				Product Application		Grand Total
	SP Sales Region	Installation Segment		Auxiliary Engine	Main Engine	
☐	MEA	Offshore	Sum of Power Output in kW	32 800	368 180	400 980
			Sum of Running Hours	75 573	368 306	443 879
			Record Count	7	95	102
		Cruise & Ferry	Sum of Power Output in kW	11 200	105 800	117 000
			Sum of Running Hours	16 550	78 753	95 303
			Record Count	3	12	15
		Special Vessels	Sum of Power Output in kW	30 815	316 643	347 458
			Sum of Running Hours	57 871	344 223	402 094
			Record Count	19	115	134
		Subtotal	Sum of Power Output in kW	74 815	790 623	865 438
			Sum of Running Hours	149 994	791 282	941 276
			Record Count	29	222	251
☐	AMER	Offshore	Sum of Power Output in kW	7 800	569 650	577 450
			Sum of Running Hours	332	759 060	759 392
			Record Count	3	129	132
		Cruise & Ferry	Sum of Power Output in kW	0	393 420	393 420
			Sum of Running Hours	0	224 020	224 020
			Record Count	0	43	43
		Special Vessels	Sum of Power Output in kW	0	23 270	23 270
			Sum of Running Hours	0	35 409	35 409
			Record Count	0	9	9
		Subtotal	Sum of Power Output in kW	7 800	986 340	994 140
			Sum of Running Hours	332	1 018 489	1 018 821
			Record Count	3	181	184
☐	EUAF	Offshore	Sum of Power Output in kW	24 980	633 198	658 178
			Sum of Running Hours	13 483	768 003	781 486
			Record Count	10	161	171
		Cruise & Ferry	Sum of Power Output in kW	7 980	426 232	434 212
			Sum of Running Hours	71 883	241 329	313 212
			Record Count	6	44	50
		Special Vessels	Sum of Power Output in kW	14 055	285 717	299 772
			Sum of Running Hours	24 144	294 271	318 415
			Record Count	15	86	101
		Subtotal	Sum of Power Output in kW	47 015	1 345 147	1 392 162
			Sum of Running Hours	109 510	1 303 603	1 413 113
			Record Count	31	291	322
		Grand Total	Sum of Power Output in kW	129 630	3 122 110	3 251 740
			Sum of Running Hours	259 836	3 113 374	3 373 210
			Record Count	63	694	757

As figure 6 shows Wärtsilä MS has made statistics over the amount of sold engines (main and auxiliary) per vessel typology and sales region. The most noticeable is that Wärtsilä MS delivers most engines within Africa and Europe, while the market share and sold amount of units in the Americas is very low. The market within Americas and within special vessels is almost non-existent, that means that Wärtsilä could improve net sales by

focusing on increasing the market share of special vessels in the Americas. By special vessels the focus is on dredgers, fishing vessels, tugboats and research vessels (Wärtsilä). The potential within the Americas now exist for Wärtsilä MS to introduce the Wärtsilä HY within the area.

6 Conclusion

In this chapter I conclude my thesis with reflections on the purpose and some new ideas. In the end of the chapter I present what Wärtsilä MS should focus seen from both a strategic and in an operative way.

6.1 How did I reach my purpose?

The research itself has been a very interesting and demanding project. The difficulties of reaching the purpose are mostly because of the difficulty to predict the marine market and its future. The research has been created mostly of different reports from around the world and from my view on the future. However since the practical work and the result of the thesis was much more difficult than finding theory, I consider myself quite happy with the work done. The assignment has helped me to look into of what is to come and I am happy that I have got the chance to write about the future of the marine market and what should be considered when developing the Wärtsilä MS. The exploratory approach was fitting approach for me, but created challenges that I never could have expected because the future is always to some extent unpredictable and imprescriptible.

6.2 My theoretical and practical contribution

As an explorer you have to study earlier research and then apply it to your task.

My theoretical contribution is mostly an analogy and a dialectical discussion between earlier research in sales and business and Wärtsilä as a world leading company today. As a benchmark for the whole assignment I found it important to include Wärtsilä MSs' own visions to be able to see how the Wärtsilä as a company sees things compared to the EU and Lloyd's register for example.

My practical contribution is gathering information about different market shares and data on shipbuilding around the world. Other practical work is also finding out the potential financing model that Wärtsilä MS could use in order to minimize risks and by that also increase security in sales.

6.3 Proposals for further research

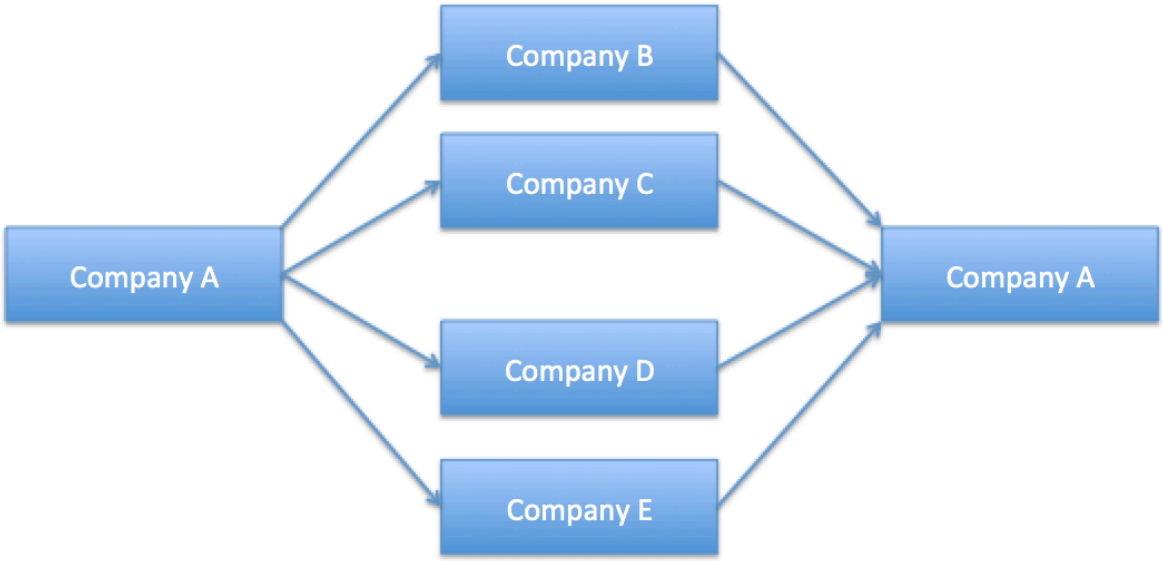
My recommendations for further research, *firstly*, concern a more in depth research regarding the specific technologies that can have an affect on the future of the marine market. *Secondly* the future research should be made in a few years after the technology and the regulations have changed from today. This would make it easier for Wärtsilä MS to follow up in which direction the market is moving. *Thirdly* a research could also be made containing numerical values and value propositions over how Wärtsilä MS could increase value for its customers. *Finally* discussions about a new pricing model that could increase net sales is something that could be created and investigated in the future.

6.4 A normative discussion

The difficulties of providing a perfect prediction about the future can be studied from older reports within different areas of business, but still the truth is as follows (it is impossible to say how the future will look like). If you had asked a person owning a horse 150 years ago how he'd like to improve getting from one place to another, he would have said: "I want a faster horse" and then the car was invented. Today a ship owner probably would like a more efficient engine with lower fuel consumption handling and fixing the operation with no costs – only revenues!

However for Wärtsilä MS I don't only think that new technologies should be considered, neither do I think constantly buying different companies is the long-term solution. When acquisitioning other and new companies as a growth strategy I want to underline the importancy of keeping existing know-how within the acquired company. Owning different companies that can provide different technologies is a way to maintain all vital documentation within one company.

Figure 5 Company A buys four different companies



As figure 5 shows if a Company A buys four other companies, company A can provide a complete solution named as it wants and tell the buyer that this solution is a company A solution. I can also provide the buyer with complete documentation without buying the information or documentation from other companies. These are of course huge benefits when it comes to value proposition and how to sell values that can help the customer or the buyer improve its own net sales. Of course having many smaller organizations or smaller companies within one big company can cause problems when it comes to how the smaller companies identify themselves. This is important also that they can maintain the know-how and the same structure even if they are serving under a mother company. Buying another company does not necessarily increase net sales it often increases costs.

I do consider it very important to keep up with the development and digitalization, but at the same time I do think it is important to be careful. The long-term solutions come from the company itself, in this case company A.

6.4.1 What should Wärtsilä MS focus on?

One thing I do think Wärtsilä MS should do in the future if they want to keep up the market shares and increase their net sales is to always be one step ahead of the development. This is of course very demanding and not easy to implement, but for an example the new environmental restrictions are something to keep a close eye on. Always try to improve engine efficiency and decrease fuel consumption by improving technology

is what should be one of the main focuses. The more environmental friendly Wärtsilä MSs' solutions can get before the competition, the better. Staying one step ahead of the competition is vital and this is something that Wärtsilä has been able to do with the Wärtsilä HY. The know-how and the knowledge within the company exist and using this to its maximum is the best way for Wärtsilä to increase net sales and market shares.

6.4.2 Thoughts about the financing model

A financing model itself doesn't generate a lot of increased net sales. However it enables Wärtsilä's MS to minimize the risks and ensure they receive the money. It costs a little, but if the borrower's country is instable the risk of losing credits is larger. The higher risk, the higher cost. It enables Wärtsilä MS to sell more if they have a smaller loss of credit. The financing model is also a benefit for the buyer, since they do not have to pay until they receive the product and their risk is smaller in. This could also be considered as a value proposition model in the future, if a financing model is implemented.

6.4.3 Summary

All in all in my opinion Wärtsilä MS should offer more complete solutions to its customers than only a product. This is because of value for the customer and that the customer can reduce overhaul and also reduce maintenance costs. Wärtsilä are also able to offer service agreements for maintenance and spare parts and could therefore start a long-term relation with new customers. Wärtsilä MS has a very large scope of products and solutions, but the importance of putting them all together in order to increase net sales is important. Selling a solution or a series of products instead of focusing on just one product would add more value to the customer as well. In order for Wärtsilä MS to increase its net sales I would consider that selling a value to the customer in order to sell a product is more important than thinking about maximizing its own sales. If the Wärtsilä can sell value to its customers then Wärtsilä's sales will automatically increase. I also think that a low- or no carbon thinking is the future and this is something that should be considered within Wärtsilä MS. The regulations are getting stricter and all current emissions will eventually have to be reduced a lot or even removed completely, the company that sets up an example for this will also be the most successful one in the future. Energy storage is something to look into and consider as an alternative to a more efficient and environmental friendly solution for the future.

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